IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 09/543,054
Filing Date ..... April 5, 2000
Inventorship ..... Parupudi et al.
Applicant ..... Microsoft Corp.
Group Art Unit 2153
Examiner ..... Barqadle
Attorney's Docket No. ms1-507
Title: "Context Aware Computing Devices and Methods"

APPEAL BRIEF

To: Commissioner for Patents
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Pursuant to 37 C.F.R. §41.37, Applicant hereby submits an appeal brief for application 09/543,054, filed April 5, 2000, within the requisite time from the date of filing the Notice of Appeal. Accordingly, Applicant appeals to the Board of Patent Appeals and Interferences seeking review of the Examiner's rejections.

(1) Real Party in Interest

The real party in interest is Microsoft Corporation, the assignee of all right, title and interest in and to the subject invention.

(2) Related Appeals and Interferences

Appellant is not aware of any other appeals, interferences, or judicial proceedings which will directly affect, be directly affected by, or otherwise have a bearing on the Board's decision to this pending appeal.

(3) Status of Claims

Claims 1-26, 29-34, 36-43, 45-59 and 62-67 are pending. Claims 1-26, 29-34, 36-43, 45-59 and 62-67 are appealed. Some of these claims were previously amended. Claims 27, 28, 35, 44, 60 and 61 were previously canceled without prejudice. Claims 1-26, 29-34, 36-43, 45-59 and 62-67 are set forth in the Appendix of Appealed Claims on page 37.

(4) Status of Amendments

A final Office Action was issued on September 8, 2005.

A response was filed on November 8, 2005 and claims 1, 13, 23, 32, 36, 37, 42, 43, 45, 58, 59 and 67 were amended.

An Office Action was issued on February 27, 2006.

A Notice of Appeal was filed on June 26, 2006.

(5) Summary of Claimed Subject Matter

A concise explanation of each of the independent claims is included in this Summary section, including specific reference characters. These specific reference characters are examples of particular elements of the drawings for certain embodiments of the claimed subject matter and the claims are not limited to solely the elements corresponding to these reference characters.

With respect to independent claim 1, a computing device (Pg. 15, line 10, 130) comprises one or more processors (Pg. 15, line 12, 132); memory (Pg. 15, line 11, 134) operably associated with the one or more processors; and a context service module (Pg. 32, line 4, 602) loadable in the memory and executable by the one or more processors to receive context information from one or more context providers (Pg. 32, line 5, 604) and process the information to determine a current device context by determining, from the context information, at least one node associated with the context information and traversing at least a portion of multiple different hierarchical tree structures (Pg. 27, line 8, 300, 302) one of which said at least one node comprises a part, wherein at least one of the tree structures is linked with and touch points into another of the tree structures.

With respect to independent claim 13, a computing device (Pg. 15, line 10, 130) comprises one or more processors (Pg. 15, line 12, 132); memory (Pg. 15, line 11, 134) operably associated with the one or more processors; and a location service module (Pg. 32, line 4, 602) loadable in the memory and executable by the one or more processors to receive location information from one or more location providers (Pg. 32, line 5, 604) and process the information to determine a current

device location by determining, from the location information, at least one node associated with the location information and traversing at least a portion of multiple hierarchical tree structures (Pg. 27, line 8, 300, 302) one of which said at least one node comprises a part, wherein at least one of the tree structures is linked with and touch points into another of the tree structures.

With respect to independent claim 23, a computing device (Pg. 15, line 10, 130) comprises one or more processors (Pg. 15, line 12, 132); one or more computer-readable media (Pg. 15, line 11, 134); at least two separate and different hierarchical tree structures (Pg. 27, line 8, 300, 302) resident on the media, one of which comprising multiple nodes each of which represents a geographical division of the Earth, the other of which comprising multiple nodes each of which represent a physical or logical entity, wherein the other of the hierarchical tree structures is linked with and touch points into the one hierarchical tree structure; and a location service module (Pg. 32, line 4, 602) loadable in the memory and executable by the one or more processors to receive location information from one or more location providers and process the information to determine a current device location that comprises a node of the hierarchical tree structure.

With respect to independent claim 32, a computing device (Pg. 15, line 10, 130) comprises one or more processors (Pg. 15, line 12, 132); one or more computer-readable media (Pg. 15, line 11, 134); multiple hierarchical tree structures (Pg. 27, line 8, 300, 302) resident on the media, one of said trees comprising multiple nodes each of which represents a physical or logical entity, said one tree structure being linked with and touch pointing into another of the tree structures, wherein said one tree structure comprises an organization specific tree

structure that has context only within a particular organization; and a location service module (Pg. 32, line 4, 602) loadable in the memory and executable by the one or more processors to receive location information from one or more location providers and process the information to determine a current device location that comprises a node associated with one or more of the hierarchical tree structure.

With respect to independent claim 37, a location-aware computing system comprises one or more computing devices (Pg. 15, line 10, 130); each computing device having a software architecture comprising: a location provider interface (Pg. 36, line 10, 700) that is configured to receive location information; a location service module (Pg. 32, line 4, 602) communicatively associated with the location provider interface and configured to receive the location information from the multiple different location providers and process the information to ascertain a current device location by determining, from the location information, at least one node associated with the location information and traversing at least a portion of one of multiple different hierarchical tree structures (Pg. 27, line 8, 300, 302) one of which said at least one node comprises a part, wherein one of said hierarchical tree structures is linked with and touch points into another hierarchical tree structure, and wherein individual different hierarchical tree structures have different root nodes; and one or more application program interfaces (API) or events (Pg. 36, line 10, 702) associated with the location service module and defining a mechanism through which information concerning a current device location can be provided to one or more applications that are configured to provide location-specific services.

With respect to independent claim 45, a computer-implemented method of determining a computing device context comprises receiving (Pg. 46, line 5, 900), with a computing device, information that pertains to a current context of the device; processing (Pg. 46, line 8, 902) the information on and with the device to ascertain the current context of the computing device by determining, from the information, at least one node associated with the information and traversing at least a portion of multiple different hierarchical tree structures one of which said at least one node comprises a part, wherein one tree structure is linked with and touch points into another tree structure and wherein said one and another tree structures have different root nodes.

With respect to independent claim 58, one or more computer-readable media have computer-readable instructions thereon which, when executed by a computing device, cause the computing device to receive (Pg. 46, line 5, 900) information that pertains to a current location of the device, the information being received from multiple different location providers; and process (Pg. 46, line 8, 902) the information to map the information to a node of a hierarchical tree structure that comprises multiple nodes that represent either (1) geographical divisions of the Earth or (2) physical or logical entities; and traverse the hierarchical tree structure to ascertain the current device location, wherein said hierarchical tree structure is touch-pointed by and linked with another tree structure from which device location can be ascertained, wherein said tree structures have different root nodes.

With respect to independent claim 59, a computer-implemented method of determining the location of a hand-held, mobile computing device comprises

maintaining multiple hierarchical tree structures (Pg. 27, line 8, 300, 302) on the mobile computing device, one tree structure comprising multiple nodes each of which represent geographical divisions of the Earth, another of the tree structures being linked with and touch-pointing into the one tree structure, wherein said tree structures have different root nodes; receiving information from multiple different location providers (Pg. 32, line 5, 604) that describe aspects of a current device location; processing the information with the mobile device to ascertain a node on one of the tree structures that likely constitutes a current device location; and traversing at least one other node of said one tree structure to ascertain additional location information that is associated with the current device location.

With respect to independent claim 67, one or more computer-readable media have computer-readable instructions thereon which, when executed by a computing device, cause the computing device to maintain or access multiple hierarchical tree structures (Pg. 27, line 8, 300, 302) on or with the computing device, one of the tree structures comprising multiple nodes each of which represent geographical divisions of the Earth, another of the tree structures being linked with and touch-pointing into the one tree structure, wherein said tree structures have different root nodes; receive information from multiple different location providers (Pg. 32, line 5, 604) that describe aspects of a current device location; process the information with the device to ascertain a node on one of the tree structures that likely constitutes a current device location; traverse at least one other node of the one tree structure to ascertain additional location information that is associated with the current device location; receive one or more calls from one or more applications for information that pertains to a current device location,

the applications being configured to render location-specific information; and supply at least some information that pertains to the current device location to the one or more applications.

(6) Grounds of Rejection to be Reviewed on Appeal

Claims 1-7, 10, 13-18, 20, 23-26, 32-34, 36, 45-55, 58, 59 and 66 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,401,051 to Merriam in view of U.S. Patent No. 5,539,922 to Wang.

Claims 8-9, 11-12, 19, 21-22, 29-31, 37-43, 56-57, 62-65 and 67 stand rejected under 35 U.S.C. §103(a) as being obvious over to Merriam in view of Wang and U.S. Patent No. 6,088,717 to Reed et al. (hereinafter "Reed").

(7) Argument

The rejection under 35 U.S.C. §103(a) over the combination of Merriam and Wang does not establish a *prima facie* case of obviousness.

Claims 1-7, 10, 13-18, 20, 23-26, 32-34, 36, 45-55, 58, 59 and 66 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,401,051 to Merriam in view of U.S. Patent No. 5,539,922 to Wang.

Applicant respectfully submits that the Office has not established a *prima facie* case of obviousness with respect to the combination of Merriam and Wang.

The §103 Standard

In making out a §103 rejection, the Federal Circuit has stated that when one or more reference or source of prior art is required in establishing obviousness, "it is necessary to ascertain whether the prior art *teachings* would appear to be

sufficient to one of ordinary skill in the art to suggest making the claimed substitutions or other modification." *In re Fine,* 5 USPQ 2d, 1596, 1598 (Fed. Cir. 1988). That is, to make out a prima facie case of obviousness, the references must be examined to ascertain whether the combined *teachings* render the claimed subject matter obvious. *In re Wood*, 202 USPQ 171, 174 (C.C.P.A. 1979).

Moreover, there is a requirement that there must be some reason, suggestion, or motivation *from the prior art*, as a whole, for the person of ordinary skill to have combined or modified the references. *See, In re Geiger,* 2 USPQ 2d 1276, 1278 (Fed. Cir. 1987). It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fritch,* 23 USPQ 2d 1780, 1784 (Fed. Cir. 1992).

A factor cutting against a finding of motivation to combine or modify the prior art is when the prior art *teaches away* from the claimed combination. A reference is said to teach away when a person or ordinary skill, upon reading the reference, would be led in a direction divergent from the path that the applicant took. *In re Gurley*, 31 USPQ 2d 1130, 1131 (Fed. Cir 1994).

The need for specificity pervades this authority. See, e.g., *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed").

In addition to the standard discussed above, the Office has provided a paper, available at the following link:

http://www.uspto.gov/web/menu/busmethp/busmeth103rej.htm

that describes proper and improper rejections made under §103(a). Particularly instructive is Example 17 that appears in Section V of the paper illustrating an improper §103(a) rejection which is based upon a proposed motivation that is simply too general and lacking in particularity. This example is reproduced below in its entirety for the Office's convenience:

V. Examples of Improper Rejection under 35 U.S.C. 103

Example 17: Improper rejection based upon hindsight - general motivation statement.

a. The claimed invention

The invention is drawn to a smart card containing a tracking mechanism, which tracks shopping preferences of consumers by recording the type, quantity, and dates of purchase for a pre-selected group of products. The smart card is useful in a system and method for introducing new and alternative products that are of the same type as products normally purchased by the shopper. The smart card records the shopper's purchases and submits an automatic notification to the shopper when a quantity threshold is achieved for the pre-selected products. This notification will encourage the consumer to consider alternative products by providing the consumer incentives, such as a pricing discount, to purchase an alternative product.

Claim 1:

A method for using a smart card in a marketing analysis program designed to introduce new products, the method comprising the steps of:

storing product information on the smart card when said products are purchased by a consumer wherein said information including type, quantity and dates of the product purchased;

identifying for each product a threshold for each of said type, quantity and dates of products purchased;

determining an incentive for an alternative product based on said threshold; and

automatically notifying said consumer when said threshold is reached for a given product identified on the smart card and providing the consumer with said incentive, whereby the incentive encourages the consumer to consider alternative products.

b. Evidence

Reference A discloses smart card that tracks consumer preferences by recording the type, quantity, and dates of purchase of pre-selected products to determine trends in consumer purchases. The smart card is periodically read by a scanner to determine its contents for market analysis. In return for using the smart card and participating in the marketing program, the user is provided with free product coupons for products that are normally purchased by the shopper.

Reference B discloses a traditional consumer incentive program that provides coupons for the purchase of named products based upon the consumer's purchase of those same products to promote customer loyalty.

c. Poor statement of the rejection

Claim 1 is rejected under 35 U.S.C. 103 as being unpatentable over Reference A in view of Reference B. Reference A discloses the conventional use of a smart card to track consumer preferences and provide incentives. However, Reference A does not disclose the automatic notification to consumer providing incentives. Reference B discloses providing incentives to consumers to purchase the desired products. ***It would have been obvious to combine Reference A's smart card with Reference B's incentive to consumers because the combination would allow Reference A's smart card to be more efficient.***

d. Analysis

The motivation, improve efficiency, is too general because it could cover almost any alteration contemplated of Reference A and does not address why this specific proposed modification would have been obvious. Additionally, there is nothing in either of references that would suggest automatically notifying the consumer when reaching a threshold nor is there anything in either reference that

would suggest the notifying step. Finally, although Reference B teaches a traditional coupon scheme to promote customer loyalty, there is no suggestion, other than applicant's disclosure, to employ this scheme to promote the introduction of new and alternative products. **The rejection is improper.**

In addition, a modification proposed by the Office cannot render the reference unsatisfactory for its intended purpose. Further, the modification proposed by the Office cannot change a principle of operation of a reference. Specifically, MPEP §2143.01 entitled "Suggestion or Motivation To Modify the References" instructs as follows.

> THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE
>
> If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (Claimed device was a blood filter assembly for use during medical procedures wherein both the inlet and outlet for the blood were located at the bottom end of the filter assembly, and wherein a gas vent was present at the top of the filter assembly. The prior art reference taught a liquid strainer for removing dirt and water from gasoline and other light oils wherein the inlet and outlet were at the top of the device, and wherein a pet-cock (stopcock) was located at the bottom of the device for periodically removing the collected dirt and water. The reference further taught that the separation is assisted by gravity. The Board concluded the claims were prima facie obvious, reasoning that it would have been obvious to turn the reference device upside down. The court reversed, finding that if the prior art device was turned upside down it would be inoperable for its intended purpose because the gasoline to be filtered would be trapped at the top, the water and heavier oils sought to be separated would flow out of the outlet instead of the purified gasoline, and the screen would become clogged.).
>
> "Although statements limiting the function or capability of a prior art device require fair consideration, simplicity of the prior art is rarely a characteristic that weighs against obviousness of a more complicated device with added function." In re Dance, 160 F.3d 1339, 1344, 48 USPQ2d 1635, 1638 (Fed. Cir. 1998) (Court held that claimed catheter for removing obstruction in blood vessels would have been obvious in view of a first reference which taught all of the claimed elements except for a "means for recovering fluid and debris" in combination with

a second reference describing a catheter including that means. The court agreed that the first reference, which stressed simplicity of structure and taught emulsification of the debris, did not teach away from the addition of a channel for the recovery of the debris.).

THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) (Claims were directed to an oil seal comprising a bore engaging portion with outwardly biased resilient spring fingers inserted in a resilient sealing member. The primary reference relied upon in a rejection based on a combination of references disclosed an oil seal wherein the bore engaging portion was reinforced by a cylindrical sheet metal casing. Patentee taught the device required rigidity for operation, whereas the claimed invention required resiliency. The court reversed the rejection holding the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate." 270 F.2d at 813, 123 USPQ at 352.).
MPEP § 2143.01

The Office's Attempted Combination of Merriam and Wang

In attempting to combine Merriam and Wang, the Office argues that Merriam discloses all the recited features of many of the claims, except for a hierarchical tree structure or traversing such a structure. The Office then relies on Wang and argues that Wang discloses a hierarchical tree structure.

Given these two references, the Office argues that their combination would render the subject matter of many of the claims obvious. In support of its argument, the Office argues that the motivation would be "because Wang's system provides an efficient way of linking root nodes of various trees in a layered hierarchical tree structure that includes countries, states, cities and specific areas and locations. In doing so, a ... device's current location in a hierarchical tree

structure of nodes is precisely determined." See, Office Action dated 2/27/2006, page 6.

Further, in the "Response to Arguments" section of the above-mentioned Office Action, the Office states Wang is relied upon to address Merriam's deficiency of traversing a hierarchical tree.

For reasons that are discussed below in more detail, Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits that the Office has failed to establish a *prima facie* case of obviousness.

Consider, for example, the nature of Merriam's disclosure. Merriam pertains to a method and apparatus for locating buried objects prior to digging at a current location. As instructed by Merriam and perhaps best illustrated in Fig. 1, a positioning device 102 is taken to the location where digging is to take place. The positioning device receives positioning signals from one or more positioning stations 106, and based upon the positioning signals, determines the current location of the positioning device and hence the location of the dig site. This determination is made based upon positioning signals provided to the positioning device 102 by the positioning stations 106.

Once the current location is determined, a registry database 110 containing the locations of previously buried objects is accessed. The registry database is queried for all locations within a selected distance of the current location which have buried objects. If this query returns no records, then it is probably safe to dig at the current location. On the other hand, if the query returns one or more locations, then further digging at the current location should either be avoided or

performed with great caution. To aid in the digging process, a map of the area around the current position may be provided showing the locations of the previously buried objects. Regardless of whether there are buried objects within close proximity to the current location, if the digger decides to bury a new object at the current location, the current location is passed to the registry database and stored. This serves to update the database to include the new object so that future queries of the registry database will reveal the presence of the newly buried object. The registry database is thus populated and grown.

Merriam describes components of its system in a little more detail in FIGS. 2a and 2b, and the related discussion in the specification. There, positioning device 102 comprises, among other elements, a positioning system 218 comprising an input mechanism (such as a receiving mechanism) for receiving positioning signals from the positioning stations 106, a determining mechanism for determining a current location based upon the positioning signals, and an output mechanism for providing the current location to the processor 212. As instructed by Merriam, the positioning system 218 is one that is capable of determining a current location accurate to within several feet. Positioning systems 218 having this degree of granularity are currently commercially available. The Differential Global Positioning System manufactured by Trimble Navigation, Inc. of Sunnyvale, Calif., is an example of such a system.

Hence, what Merriam contemplates for purposes of determining its device's location is a GPS type of system or one that provides information that can be used to determine location to within an accuracy of several feet. That is, Merriam is concerned with and requires, for purposes of operability, information that allows it

to determine its location to within a few feet. For all intents and purposes, when Merriam's device's location is determined, it is static and immobile. In fact, it must be immobile in order to glean an accurate location reading in order to determine whether there are any buried objects that might present a hazard in the presence of digging.

Consider now Wang's disclosure. Wang describes a communication system that has a hierarchical system of nodes organized into multiple node trees (800-806, 820-826, and 835). The communication system is used for completing calls between various ports (810, 812, 826) for interfacing to various transceivers (840). The method used in the hierarchical system is capable of tracking the location of the transceiver as it moves between ports and trees of the system.

Perhaps a good starting point for a full appreciation of Wang is its "Background" section where Wang describes the problem that its invention addresses. Specifically, Wang instructs that a universal personal communication system is a system enabling anyone to communicate instantly with anyone else anywhere in the world. One of the crucial problems of such a system would be locating millions of moving customers in an efficient manner. The existing techniques for locating moving customers in the system are paging and registration using a central database. Considering the large number of customers in a global system, the first technique, if applied without knowledge of the location of the customers is impractical. The registration technique, which records all the movements of customers in a central database, is also impractical because the task of keeping track of such a huge number of users would be immense. Thus, a need

exists for a system for efficiently tracking customers in a universal personal communication system.

Furthermore, Wang instructs that frequency spectrum reuse is maximized by providing a communication system with cells as small as possible. However, for a moving customer, movement from cell to cell can cause extensive updating of a location database. Additionally, communications systems such as a personal communication systems (PCS) having small cells coupled through a hierarchy of nodes must co-exist with existing communication systems during its establishment. The initial establishment of a complete hierarchy of nodes including national and global nodes may not be possible at the initial introduction of the system in some cases. Thus, according to Wang, what is needed is a method for connecting calls between developed hierarchical trees of the communication system when the trees are not related by hierarchical nodes.

Thus, characterized another way, Wang is concerned first and foremost with being able to efficiently track and locate moving customers that might move across a state, across a country, or throughout the world.

For an appreciation of Wang's approach, consider its Fig. 1 which shows a hierarchical structure for a communication system 100. The covered area of the communication system 100 is organized into a hierarchical structure having several layers. The highest layer may be the earth 102 followed by country 104, state 106, area code 108, city 110, and the lowest layer (Layer 1) is a primary layer that comprises a plurality of independent paging regions (cells) 112, each region defining an area or location in which one may be paged. Each layer 1 cell comprises one or more base stations. Layer 1 may comprise a radio telephone

communication system (e.g., Digital European Cordless Telephone). In the description that follows, Wang refers to layer 1 cells as base stations. Each region of layer "i" (except the lowest layer) consists of several regions of layer "i-1.".

Each block in layers 2 through 6 (the secondary layers) is a communication service node representing a switching station having computing and memory means (i.e., all layers >1 are intelligent layers). The memory means comprises a database for tracking the location of customers (i.e., users of portable communication units that are registered in the system).

In this system, as Wang instructs, an active customer does not necessarily communicate on the portable communication unit, but the movement of the portable communication unit is traced by the system. A customer is active when the power of the portable communication unit is on.

Referring to Wang's FIG. 5, a diagram illustrates an example of an address chain before moving, for a portable communication unit 24. In this example, the called party (unit 24) has a home address in cell 1,d, and a current address at cell 8,d. In a first case, the communication unit 20, located in cell 2,c, places a call to communication unit 24. The communication unit 20 merely dials the home address number of the called party. The calling party's connection request is received by a base station at cell 2,c, and it is passed on to the Boynton node in layer 2.

At the Boynton node, the corresponding database is searched for an entry relating to the called party. In this case an entry is found in the database. The entry contains the home address (HA) of the called party and an "OUT" indication. The call is then forwarded along the address chain to the "407" node of layer 3, where the database also contains the home address of the called party and an "OUT"

indication. Thus, the connection request is further traced up through the Florida node of layer 4, also indicating that the called party is "OUT". Then, in the U.S.A. node of layer 5 the database indicates that the portable 24 device is in Georgia. The tracing then continues to the Georgia node, where the area code "404" is indicated. Thereafter, the tracing process continues to the "404" node, where "Atlanta" is indicated. Searching in the Atlanta database reveals the precise location of the portable communication unit 24, and the requested connection is made.

Referring again to FIG. 5, in a second case the call for the called party is made from a calling communication unit 22 (also a portable in this example) located at cell 9,c. Accordingly, the call is received at the base station in cell 9,c, and is passed on to the Athens node in layer 2. There is no entry relating to the called party in the Athens database. Therefore, the connection request is passed on to the next node toward the home address of the called party (i.e., the "404" node). The database at the "404" node contains an entry (HA, Atlanta) indicating that the called party is in Atlanta. The connection request is accordingly passed on to the Atlanta node where the exact location of the portable 24 is determined to be in the 8,d cell, and the requested connection is made.

Thus, Wang pertains to and is primarily concerned with finding the locations of portable communication devices. In addition, the granularity with which Wang is concerned does not go to the level of several feet. Rather, the granularity is at the cell level—which is a region or area within which one may be paged. Wang further instructs that a cell area may be on the order of 20 kilometers.

The Office has not established a *prima facie* case of obviousness with regard to the combination of Merriam and Wang for at least the following five reasons: (1) the Office's stated motivation to combine the references (i.e. for efficiency) is simply too broad so as to support any modification of Merriam; (2) modifying Merriam to incorporate Wang's teachings would render Merriam unsatisfactory for its intended purpose; (3) modifying Merriam to incorporate Wang's teachings would change the principle of operation of Merriam; (4) Wang teaches directly away from the notion of a device determining its own location; and (5) the Office's combination of Merriam and Wang does not provide all of the elements of many of the claims.

With regard to the first reason the Office has failed to establish a *prima facie* case of obviousness, the Office's stated motivation to combine these references is simply too general and lacking in the type of particularity that would establish why a skilled artisan would have combined these references in the manner argued by the Office. In addition, it does not appear that Merriam suffers from any inefficiency that would be solved by Wang's solution.

Specifically, with regard to the Office's argued efficiency motivation, Merriam specifically states that "[p]ositioning systems 218 having this degree of granularity are currently commercially available. The Differential Global Positioning System manufactured by Trimble Navigation, Inc. of Sunnyvale, Calif., is an example of such a system." Hence, according to Merriam's own disclosure, using a GPS system is *sufficient* to enable its device to acquire information at the level of granularity that is necessary for it to function properly. That is, Merriam's discussion of the commercially available GPS-type systems

does not state or even imply that there are any inefficiencies that require attention. Hence, for at least this reason, the Office's stated motivation to combine Merriam and Wang is misplaced and inappropriate. In addition, whether Wang does or does not disclose an efficient way to link root nodes is completely irrelevant when considered in the context of Merriam's disclosure. Specifically, Merriam has disclosed a specific way for it to accomplish its location determination – using GPS type systems. Merriam's disclosed way does not utilize hierarchical trees of any nature. Accordingly, there is no need to consider how to efficiently link root nodes in hierarchical trees that are non-existent in Merriam.

With regard to the second reason the Office has failed to establish a *prima facie* case of obviousness, modifying Merriam to incorporate Wang's teachings would render Merriam unsatisfactory for its intended purpose. Specifically, Merriam operates at the granularity of a few feet. This is necessary for it to adequately determine its location so that the presence of buried objects can be found. Wang, on the other hand, operates at the granularity of cell regions which, as indicated above, can be on the order of 20 kilometers. By incorporating Wang's teachings into Merriam's disclosure, Merriam would now be determining its location at the cell region level. This being the case, it would be impossible for Merriam's device to meaningfully determine the location of buried objects with the precision that is required for safe digging. Hence, making the Office's suggested combination would render Merriam unsatisfactory for its intended purpose.

With regard to the third reason the Office has failed to establish a *prima facie* case of obviousness, modifying Merriam to incorporate Wang's teachings

would change the principle of operation of Merriam. That is, as it stands now, Merriam simply receives its location information from, for example, a GPS provider. This information contains all of the information that is needed for Merriam to operate. Modifying Merriam to adopt a hierarchical tree and to require a tree traversal to determine its location would require Merriam's principle of operation to change. In fact, it is unclear at best how or why one might do such a thing. Applicant respectfully submits that Merriam's system and method have no need whatsoever for determining the precise location of its positioning device in a hierarchical tree structure that includes countries, states, and cities. Merriam's positioning device determines its current location and whether it is safe to dig at that current location. To do this, the device determines its current location and then sends this information to a central computer that searches a database to determine whether it is safe to dig at that particular location. After determining whether it is safe to dig at the current location, the central computer sends this information back to the device, and the user of the device can act accordingly.

It would be pointless as well as a waste of time and resources for Merriam's device to traverse a tree structure of nodes to determine its precise location in a hierarchical tree structure of nodes. For example, Merriam's device has no need to determine that its current location is in Seattle, which is in Washington, which is in the United States. The only thing that the device needs to know is whether there are any objects buried in close proximity to the current location.

With regard to the fourth reason the Office has failed to establish a *prima facie* case of obviousness, Wang teaches directly away from the notion of a device determining its own location and hence, teaches away from Merriam. More

specifically, Merriam's device determines its own location based on, for example, GPS data that it receives. It then conveys this information to a remote database which then checks to ascertain whether there are any buried objects at that location. Wang, on the other hand, employs a number of nodes (See, e.g. Fig. 5 and the discussion above) which individually maintain information associated with the location of a cell phone. It does not appear that Wang's cell phone plays any role in the location determination process other than, for example, providing an indication that it is in a particular cell region. It is this indication that is then used by other remote computing devices to track the location of the cell phone. Hence, Wang teaches directly away from the notion of a computing device determining its own location. Thus, in view of these contrary teachings, there would be no motivation to combine Merriam's teaching and Wang's teachings.

With regard to the fifth reason the Office has failed to establish a *prima facie* case of obviousness, the combination of the references does not disclose all of several of the claims' subject matter. That is, at least some of the independent claims recite that the hierarchical tree structure is in some way embodied on the computing device whose location is being determined. Yet, Wang's so-called hierarchical tree is not embodied on the computing device whose location is being determined. Accordingly, for those claims that recite that the hierarchical tree resides on the computing device whose location or context is being determined, the Office has not established a *prima facie* case of obviousness.

For each of or a sub-combination of the reasons mentioned above, the Office has failed to establish a *prima facie* case of obviousness with regard to the combination of Merriam and Wang.

Claims 1-26, 29-34, 36-43, 45-59, and 62-67

Claim 1 recites a computing device comprising:

- one or more processors;
- memory operably associated with the one or more processors; and
- a context service module loadable in the memory and executable by the one or more processors to receive context information from one or more context providers and process the information to determine a current device context by determining, from the context information, at least one node associated with the context information and traversing at least a portion of multiple different hierarchical tree structures one of which said at least one node comprises a part, wherein at least one of the tree structures is linked with and touch points into another of the tree structures.

In making out the rejection of the claim, the Office argues that Merriam discloses all of the subject matter of the independent claim except for traversing different hierarchical tree structures. For this feature, the Office relies on Wang and argues that its combination with Merriam would render the subject matter obvious. As a motivation for making this combination, the Office argues that the motivation would be because "Wang's system provides an efficient way of linking root nodes of various trees in a layered hierarchical tree structure that includes countries, states, cities and specific areas and locations." See, Office Action 2/27/2006, page 6.

Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits, for at least reasons (1), (2), (3) and (4) mentioned above, that the Office has failed to establish a *prima facie* case of obviousness.

Claims 2-12 depend from claim 1 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 1, are neither disclosed nor suggested in the references cited and applied by the Office. In addition, to the extent that claim 1 is allowable, the rejection of claims 8, 9, 11 and 12 over Reed are not seen to add anything of significance.

Claim 13 recites a computing device comprising:

- one or more processors;
- memory operably associated with the one or more processors; and
- a location service module loadable in the memory and executable by the one or more processors to receive location information from one or more location providers and process the information to determine a current device location by determining, from the location information, at least one node associated with the location information and traversing at least a portion of multiple hierarchical tree structures one of which said at least one node comprises a part, wherein at least one of the tree structures is linked with and touch points into another of the tree structures.

In making out the rejection of the claim, the Office argues that Merriam discloses all of the subject matter of the independent claim except for traversing hierarchical tree structures. For this feature, the Office relies on Wang and argues that its combination with Merriam would render the subject matter obvious. As a motivation for making this combination, the Office argues that the motivation would be because "Wang's system provides an efficient way of linking root nodes of various trees in a layered hierarchical tree structure that includes countries, states, cities and specific areas and locations." See, Office Action 2/27/2006, page 6.

Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits, for at least reasons (1), (2), (3) and (4) mentioned above, that the Office has failed to establish a *prima facie* case of obviousness.

Claims 14-22 depend from claim 13 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 13, are neither disclosed nor suggested in the references cited and applied by the Office. In addition, to the extent that claim 13 is allowable, the rejection of claims 19, 21 and 22 over Reed are not seen to add anything of significance.

Claim 23 recites a computing device comprising:

- one or more processors;
- one or more computer-readable media;
- at least two separate and different hierarchical tree structures resident on the media, one of which comprising multiple nodes each of which represents a geographical division of the Earth, the other of which comprising multiple nodes each of which represent a physical or logical entity, wherein the other of the hierarchical tree structures is linked with and touch points into the one hierarchical tree structure; and
- a location service module loadable in the memory and executable by the one or more processors to receive location information from one or more location providers and process the information to determine a current device location that comprises a node of the hierarchical tree structure.

In making out the rejection of the claim, the Office argues that Merriam discloses all of the subject matter of the independent claim except for hierarchical tree structures. For this feature, the Office relies on Wang and argues that its

combination with Merriam would render the subject matter obvious. As a motivation for making this combination, the Office argues that the motivation would be because "Wang's system provides an efficient way of linking root nodes of various trees in a layered hierarchical tree structure that includes countries, states, cities and specific areas and locations." See, Office Action 2/27/2006, page 6.

Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits, for at least reasons (1), (2), (3), (4) and (5) mentioned above, that the Office has failed to establish a *prima facie* case of obviousness.

Claims 24-31 depend from claim 23 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 23, are neither disclosed nor suggested in the references cited and applied by the Office. In addition, to the extent that claim 23 is allowable, the rejection of claims 29-31 over Reed are not seen to add anything of significance.

Claim 32 recites a computing device comprising:

- one or more processors;
- one or more computer-readable media;
- multiple hierarchical tree structures resident on the media, one of said trees comprising multiple nodes each of which represents a physical or logical entity, said one tree structure being linked with and touch pointing into another of the tree structures, wherein said one tree structure comprises an organization specific tree structure that has context only within a particular organization; and
- a location service module loadable in the memory and executable by the one or more processors to receive location information from one or more location providers and process the information to determine

a current device location that comprises a node associated with one or more of the hierarchical tree structure.

In making out the rejection of the claim, the Office argues that Merriam discloses all of the subject matter of the independent claim except for hierarchical tree structures. For this feature, the Office relies on Wang and argues that its combination with Merriam would render the subject matter obvious. As a motivation for making this combination, the Office argues that the motivation would be because "Wang's system provides an efficient way of linking root nodes of various trees in a layered hierarchical tree structure that includes countries, states, cities and specific areas and locations." See, Office Action 2/27/2006, page 6.

Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits, for at least reasons (1), (2), (3), (4) and (5) mentioned above, that the Office has failed to establish a *prima facie* case of obviousness.

Claims 33, 34 and 36 depend from claim 32 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 32, are neither disclosed nor suggested in the references cited and applied by the Office.

Claim 37 recites a location-aware computing system comprising:

- one or more computing devices;
- each computing device having a software architecture comprising:
    - a location provider interface that is configured to receive location information;
    - a location service module communicatively associated with the location provider interface and configured to receive the location

information from the multiple different location providers and process the information to ascertain a current device location by determining, from the location information, at least one node associated with the location information and traversing at least a portion of one of multiple different hierarchical tree structures one of which said at least one node comprises a part, wherein one of said hierarchical tree structures is linked with and touch points into another hierarchical tree structure, and wherein individual different hierarchical tree structures have different root nodes; and

- one or more application program interfaces (API) or events associated with the location service module and defining a mechanism through which information concerning a current device location can be provided to one or more applications that are configured to provide location-specific services.

In making out the rejection of the claim, the Office argues that Merriam discloses all of the subject matter of the independent claim except for hierarchical tree structures and an API. For the hierarchical tree structures feature, the Office relies on Wang and argues that its combination with Merriam would render the subject matter obvious. As a motivation for making this combination, the Office argues that the motivation would be because "Wang's system provides an efficient way of linking root nodes of various trees in a layered hierarchical tree structure that includes countries, states, cities and specific areas and locations."

Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits, for at least reasons (1), (2), (3) and (4) mentioned above, that the Office has failed to establish a *prima facie* case of obviousness. In addition, to the extent that this claim is allowable, the further rejection over Reed is not seen to add anything of significance.

Claims 38-43 depend from claim 37 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 37, are neither disclosed nor suggested in the references cited and applied by the Office.

Claim 45 recites a computer-implemented method of determining a computing device context comprising:

- receiving, with a computing device, information that pertains to a current context of the device;
- processing the information on and with the device to ascertain the current context of the computing device by determining, from the information, at least one node associated with the information and traversing at least a portion of multiple different hierarchical tree structures one of which said at least one node comprises a part, wherein one tree structure is linked with and touch points into another tree structure and wherein said one and another tree structures have different root nodes.

In making out the rejection of the claim, the Office argues that Merriam discloses all of the subject matter of the independent claim except for hierarchical tree structures. For this feature, the Office relies on Wang and argues that its combination with Merriam would render the subject matter obvious. As a motivation for making this combination, the Office argues that the motivation would be because "Wang's system provides an efficient way of linking root nodes of various trees in a layered hierarchical tree structure that includes countries, states, cities and specific areas and locations." See, Office Action 2/27/2006, page 6.

Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully

submits, for at least reasons (1), (2), (3) and (4) mentioned above, that the Office has failed to establish a *prima facie* case of obviousness.

Claims 46-57 depend from claim 45 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 45, are neither disclosed nor suggested in the references cited and applied by the Office. In addition, to the extent that claim 45 is allowable, the rejection of claims 56 and 57 over Reed are not seen to add anything of significance.

Claim 58 recites one or more computer-readable media having computer-readable instructions thereon which, when executed by a computing device, cause the computing device to:

- receive information that pertains to a current location of the device, the information being received from multiple different location providers; and
- process the information to map the information to a node of a hierarchical tree structure that comprises multiple nodes that represent either (1) geographical divisions of the Earth or (2) physical or logical entities; and
- traverse the hierarchical tree structure to ascertain the current device location, wherein said hierarchical tree structure is touch-pointed by and linked with another tree structure from which device location can be ascertained, wherein said tree structures have different root nodes.

In making out the rejection of the claim, the Office argues that Merriam discloses all of the subject matter of the independent claim except for hierarchical tree structures. For this feature, the Office relies on Wang and argues that its combination with Merriam would render the subject matter obvious. As a

motivation for making this combination, the Office argues that the motivation would be because "Wang's system provides an efficient way of linking root nodes of various trees in a layered hierarchical tree structure that includes countries, states, cities and specific areas and locations." See, Office Action 2/27/2006, page 6.

Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits, for at least reasons (1), (2), (3) and (4) mentioned above, that the Office has failed to establish a *prima facie* case of obviousness.

Claim 59 recites a computer-implemented method of determining the location of a hand-held, mobile computing device comprising:

- maintaining multiple hierarchical tree structures on the mobile computing device, one tree structure comprising multiple nodes each of which represent geographical divisions of the Earth, another of the tree structures being linked with and touch-pointing into the one tree structure, wherein said tree structures have different root nodes;
- receiving information from multiple different location providers that describe aspects of a current device location;
- processing the information with the mobile device to ascertain a node on one of the tree structures that likely constitutes a current device location; and
- traversing at least one other node of said one tree structure to ascertain additional location information that is associated with the current device location.

In making out the rejection of the claim, the Office argues that Merriam discloses all of the subject matter of the independent claim except for hierarchical tree structures. For this feature, the Office relies on Wang and argues that its combination with Merriam would render the subject matter obvious. As a

motivation for making this combination, the Office argues that the motivation would be because "Wang's system provides an efficient way of linking root nodes of various trees in a layered hierarchical tree structure that includes countries, states, cities and specific areas and locations." See, Office Action 2/27/2006, page 6.

Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits, for at least reasons (1), (2), (3), (4) and (5) mentioned above, that the Office has failed to establish a *prima facie* case of obviousness.

Claims 62-66 depend from claim 59 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited which, in combination with those recited in claim 59, are neither disclosed nor suggested in the references cited and applied by the Office. In addition, to the extent that claim 59 is allowable, the rejection of these claims over Reed is not seen to add anything of significance.

Claim 67 recites one or more computer-readable media having computer-readable instructions thereon which, when executed by a computing device, cause the computing device to:

- maintain or access multiple hierarchical tree structures on or with the computing device, one of the tree structures comprising multiple nodes each of which represent geographical divisions of the Earth, another of the tree structures being linked with and touch-pointing into the one tree structure, wherein said tree structures have different root nodes;
- receive information from multiple different location providers that describe aspects of a current device location;
- process the information with the device to ascertain a node on one of the tree structures that likely constitutes a current device location;

- traverse at least one other node of the one tree structure to ascertain additional location information that is associated with the current device location;
- receive one or more calls from one or more applications for information that pertains to a current device location, the applications being configured to render location-specific information; and
- supply at least some information that pertains to the current device location to the one or more applications.

In making out the rejection of the claim, the Office argues that Merriam discloses all of the subject matter of the independent claim except for hierarchical tree structures. For the hierarchical tree structures feature, the Office relies on Wang and argues that its combination with Merriam would render the subject matter obvious. As a motivation for making this combination, the Office argues that the motivation would be because "Wang's system provides an efficient way of linking root nodes of various trees in a layered hierarchical tree structure that includes countries, states, cities and specific areas and locations."

Applicant respectfully disagrees with the Office's combination and its stated motivation to combine these references. As such, Applicant respectfully submits, for at least reasons (1), (2), (3) and (4) mentioned above, that the Office has failed to establish a *prima facie* case of obviousness. In addition, to the extent that this claim is allowable, the further rejection over Reed is not seen to add anything of significance.

Conclusion

The Office's basis and supporting rationale for the § 103(a) rejections is not supported by the teaching of the cited references. Applicant respectfully requests that the rejections be overturned and that the pending claims be allowed to issue.

Respectfully Submitted,

Dated: 8/15/06

By: _____

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(8) Appendix of Appealed Claims

1. (Previously Presented) A computing device comprising:

one or more processors;

memory operably associated with the one or more processors; and

a context service module loadable in the memory and executable by the one or more processors to receive context information from one or more context providers and process the information to determine a current device context by determining, from the context information, at least one node associated with the context information and traversing at least a portion of multiple different hierarchical tree structures one of which said at least one node comprises a part, wherein at least one of the tree structures is linked with and touch points into another of the tree structures.

2. (Original) The computing device of claim 1 embodied as a mobile computing device.

3. (Original) The computing device of claim 1 embodied as a desktop computing device.

4. (Original) The computing device of claim 1, wherein the device comprises cache memory that maintains a current device context.

5. (Original) The computing device of claim 1, wherein the context service module is configured to automatically receive the context information from the context providers.

6. (Original) The computing device of claim 1, wherein the context service module is configured to automatically receive the context information from the context providers and, as the context of the computing device changes, process the information to determine a new current device context.

7. (Original) The computing device of claim 1, wherein the context service module is configured to request context information from one or more of the context providers.

8. (Original) The computing device of claim 1, wherein the context service module is configured to provide information concerning a current device context to one or more applications.

9. (Original) The computing device of claim 8, wherein the context service module is configured to receive a request from the one or more applications that request the current device context information.

10. (Original) The computing device of claim 1 further comprising a context provider interface associated with the context service module, the context provider

interface comprising a common interface that is capable is receiving context information from multiple different context providers.

11. (Original) The computing device of claim 1 further comprising one or more application program interfaces (APIs) operably associated with the context service module, the one or more APIs being callable by one or more applications to acquire information concerning the current device context.

12. (Original) The computing device of claim 1 further comprising one or more events that are configured for use by one or more applications so that the applications can register to receive information concerning a current device context responsive to the occurrence of one or more events.

13. (Previously Presented) A computing device comprising:

one or more processors;

memory operably associated with the one or more processors; and

a location service module loadable in the memory and executable by the one or more processors to receive location information from one or more location providers and process the information to determine a current device location by determining, from the location information, at least one node associated with the location information and traversing at least a portion of multiple hierarchical tree structures one of which said at least one node comprises a part, wherein at least one of the tree structures is linked with and touch points into another of the tree structures.

14. (Original) The computing device of claim 13 embodied as a mobile computing device.

15. (Original) The computing device of claim 13 embodied as a desktop computing device.

16. (Original) The computing device of claim 13, wherein the location service module is configured to automatically receive the location information from the location providers.

17. (Original) The computing device of claim 13, wherein the location service module is configured to automatically receive the location information from the location providers and, as the location of the computing device changes, process the information to determine a new current device location.

18. (Original) The computing device of claim 13, wherein the location service module is configured to request location information from one or more of the location providers.

19. (Original) The computing device of claim 13, wherein the location service module is configured to provide information concerning a current device location to one or more applications.

20. (Original) The computing device of claim 13, further comprising a location provider interface associated with the location service module, the location provider interface comprising a common interface that is capable is receiving location information from multiple different location providers.

21. (Original) The computing device of claim 13, further comprising one or more application program interfaces (APIs) operably associated with the location service module, the one or more APIs being callable by one or more applications to acquire information concerning the current device location.

22. (Original) The computing device of claim 13, further comprising one or more events that are configured for use by one or more applications so that the applications can register to receive information concerning a current device location responsive to the occurrence of one or more events.

23. (Previously Presented) A computing device comprising:

one or more processors;

one or more computer-readable media;

at least two separate and different hierarchical tree structures resident on the media, one of which comprising multiple nodes each of which represents a geographical division of the Earth, the other of which comprising multiple nodes each of which represent a physical or logical entity, wherein the other of the hierarchical tree structures is linked with and touch points into the one hierarchical tree structure; and

a location service module loadable in the memory and executable by the one or more processors to receive location information from one or more location providers and process the information to determine a current device location that comprises a node of the hierarchical tree structure.

24. (Original) The computing device of claim 23 embodied as a mobile computing device.

25. (Original) The computing device of claim 23 embodied as a desktop computing device.

26. (Original) The computing device of claim 23, wherein the location service module is configured to determine the current device location by traversing multiple nodes of the hierarchical tree.

27. (Canceled).

28. (Canceled).

29. (Original) The computing device of claim 23, wherein the location service module is configured to provide information concerning a current device location to one or more applications for rendering location-specific services.

30. (Original) The computing device of claim 29, wherein the location service module is configured to receive calls from the one or more applications that request the information concerning the current device location.

31. (Original) The computing device of claim 29, wherein the location service module is configured to register one or more applications for notification of information concerning a current device location upon the occurrence of a definable event.

32. (Previously Presented) A computing device comprising:

one or more processors;

one or more computer-readable media;

multiple hierarchical tree structures resident on the media, one of said trees comprising multiple nodes each of which represents a physical or logical entity, said one tree structure being linked with and touch pointing into another of the tree structures, wherein said one tree structure comprises an organization specific tree structure that has context only within a particular organization; and

a location service module loadable in the memory and executable by the one or more processors to receive location information from one or more location providers and process the information to determine a current device location that comprises a node associated with one or more of the hierarchical tree structure.

33. (Original) The device of claim 32 embodied as a mobile computing device.

34. (Original) The device of claim 32 embodied as a desktop computing device.

35. (Canceled).

36. (Previously Presented) The device of claim 32 further comprising one or more services associated with one or more nodes of said one hierarchical tree structure, the device comprising an application that is executing on the one or more processors to traverse said one hierarchical tree structure to locate the one or more service.

37. (Previously Presented) A location-aware computing system comprising:

one or more computing devices;

each computing device having a software architecture comprising:

a location provider interface that is configured to receive location information;

a location service module communicatively associated with the location provider interface and configured to receive the location information from the multiple different location providers and process the information to ascertain a current device location by determining, from the location information, at least one node associated with the location information and traversing at least a portion of one of multiple different hierarchical tree structures one of which said at least one node comprises a part, wherein one of said hierarchical tree structures is linked with and touch points into another hierarchical tree structure, and wherein individual different hierarchical tree structures have different root nodes; and

one or more application program interfaces (API) or events associated with the location service module and defining a mechanism through which information concerning a current device location can be provided to one or more applications that are configured to provide location-specific services.

38. (Original) The location-aware computing system of claim 37, wherein at least one of the one or more computing devices comprises a mobile computing device.

39. (Original) The location-aware computing system of claim 37, wherein at least one of the one or more computing devices comprises a desktop computing device.

40. (Original) The location-aware computing system of claim 37, wherein the location provider interface is configured to receive location information from multiple different location providers.

41. (Original) The location-aware computing system of claim 37, wherein the location provider interface is configured to receive location information from multiple different location providers, the location service module being configured to poll one or more of the location providers so that the polled location provider can provide location information to the location provider interface.

42. (Previously Presented) The location-aware computing system of claim 37 further comprising:

one or more computer-readable media; and

said multiple different hierarchical tree structures being resident on the media, wherein said another tree structure comprises multiple nodes each of which represent geographical divisional of the Earth, the location service module being configured to process the information to ascertain a current device location that comprises one node on said another hierarchical tree structure.

43. (Previously Presented) The location-aware computing system of claim 42, wherein the location service module is configured to ascertain a current device location by traversing at least one of the hierarchical tree structures to a root of the tree structure.

44. (Canceled).

45. (Previously Presented) A computer-implemented method of determining a computing device context comprising:

receiving, with a computing device, information that pertains to a current context of the device;

processing the information on and with the device to ascertain the current context of the computing device by determining, from the information, at least one node associated with the information and traversing at least a portion of multiple different hierarchical tree structures one of which said at least one node comprises

a part, wherein one tree structure is linked with and touch points into another tree structure and wherein said one and another tree structures have different root nodes.

46. (Original) The computer-implemented method of claim 45, wherein said receiving comprises receiving the information with a mobile computing device.

47. (Original) The computer-implemented method of claim 45, wherein said receiving comprises receiving the information with a hand-held computing device.

48. (Original) The computer-implemented method of claim 45, wherein said receiving comprises receiving the information with a desktop computing device.

49. (Original) The computer-implemented method of claim 45, wherein the current context is the device location.

50. (Original) The computer-implemented method of claim 49, wherein the receiving of the information comprise receiving information from multiple different location providers.

51. (Original) The computer-implemented method of claim 50, wherein the information that is received from the multiple different location providers is received in different forms.

52. (Original) The computer-implemented method of claim 50, wherein the receiving of the information comprises receiving the information through a common interface.

53. (Original) The computer-implemented method of claim 45, wherein the receiving of the information comprise receiving information from multiple different context providers.

54. (Original) The computer-implemented method of claim 53, wherein the information that is received from the multiple different location providers is received in different forms.

55. (Original) The computer-implemented method of claim 53, wherein the receiving of the information comprises receiving the information through a common interface.

56. (Original) The computer-implemented method of claim 45 further comprising receiving a request from an application for information that pertains to the current context of the mobile computing device and returning at least some information to the application.

57. (Original) The computer-implemented method of claim 45 further comprising receiving at least one event registration from one or more applications that pertains to an event for which the application is to receive information

pertaining to the current context of the computing device, and returning information pertaining to the current context of the computing device to the one or more applications responsive to the occurrence of an event.

58. (Previously Presented) One or more computer-readable media having computer-readable instructions thereon which, when executed by a computing device, cause the computing device to:

receive information that pertains to a current location of the device, the information being received from multiple different location providers; and

process the information to map the information to a node of a hierarchical tree structure that comprises multiple nodes that represent either (1) geographical divisions of the Earth or (2) physical or logical entities; and

traverse the hierarchical tree structure to ascertain the current device location, wherein said hierarchical tree structure is touch-pointed by and linked with another tree structure from which device location can be ascertained, wherein said tree structures have different root nodes.

59. (Previously Presented) A computer-implemented method of determining the location of a hand-held, mobile computing device comprising:

maintaining multiple hierarchical tree structures on the mobile computing device, one tree structure comprising multiple nodes each of which represent geographical divisions of the Earth, another of the tree structures being linked with and touch-pointing into the one tree structure, wherein said tree structures have different root nodes;

receiving information from multiple different location providers that describe aspects of a current device location;

processing the information with the mobile device to ascertain a node on one of the tree structures that likely constitutes a current device location; and

traversing at least one other node of said one tree structure to ascertain additional location information that is associated with the current device location.

60. (Canceled).

61. (Canceled).

62. (Original) The computer-implemented method of claim 59 further comprising receiving a request from one or more applications for information that pertains to a current device location and providing the one or more applications with the information that pertains to the current device location.

63. (Original) The computer-implemented method of claim 62, wherein the receiving of the request comprises receiving a call to an application program interface (API).

64. (Original) The computer-implemented method of claim 62, wherein the receiving of the request comprises receiving an event registration.

65. (Original) The computer-implemented method of claim 62 further comprising applying a security policy to the information that pertains to the current device location before providing the information to the one or more applications.

66. (Original) The computer-implemented method of claim 59 further comprising before processing the information to ascertain a node, resolving any conflicts that might exist between information that is received from different location providers.

67. (Previously Presented) One or more computer-readable media having computer-readable instructions thereon which, when executed by a computing device, cause the computing device to:

maintain or access multiple hierarchical tree structures on or with the computing device, one of the tree structures comprising multiple nodes each of which represent geographical divisions of the Earth, another of the tree structures being linked with and touch-pointing into the one tree structure, wherein said tree structures have different root nodes;

receive information from multiple different location providers that describe aspects of a current device location;

process the information with the device to ascertain a node on one of the tree structures that likely constitutes a current device location;

traverse at least one other node of the one tree structure to ascertain additional location information that is associated with the current device location;

receive one or more calls from one or more applications for information that pertains to a current device location, the applications being configured to render location-specific information; and

supply at least some information that pertains to the current device location to the one or more applications.

(9) Evidence Appendix

None.

(10) Related Proceedings Appendix

None.